River Team sub-catchment Partnership Notes

21st October 2021 virtual meeting on Teams

Attendees Sophie Turnbull - Chair(EA), Peter Shield(GMBC), Gayle Wilson (GMBC), Liz Walters(TRT), Zoe Lewin(DCC), Brian Weatherall(DCC), Richard Wilson(WT), Amanda McKevitt(EA), Sally Gallagher(EA), Stephen Thompson(NWG), Michele MacCallam(Groundwork), Clare Sweeney(EA), Becka Bessant(HE), Lee Wyatt(CA), Clare Ross, David Werner (NU), Michelle McGinn (GMBC), Aom Plaimart (NU)

1. **Welcome** ST EA
2. **Lamesley, CSOs and Citizen Science** David Werner (NU) and Aom Plaimart (NU)

Lamesley treatment works uses natural methods to treat both sewage and coal effluent. Aom Plaimart has been conducting the research at Lamesley constructed wetlands which looks like a series of ponds but has emergent vegetation. The following points are features of constructed wetlands:

- plants play an important role in removing contaminants
- natural processes taking place include filtration, chemical conversion and adsorption
- provides a low-cost solution while providing and multiple benefits

The objectives of this study were to:

- determine chemical quality of water at 6 locations
- determine the efficiency of removal of human pathogens and gut biomes
- investigate how effectively wetlands can turn minewater and treated sewage into a surface water microbiome

Methods used included chemical and microbiological analysis, DNA sequencing of bacteria and multi-variate data analysis.

Results:

The water in the wetlands had fewer nutrients than the river, heavy metals also reduced by wetlands (61% of 5 selected heavy metals were removed) and there was an 80% reduction of faecal coliform and approx. 83% reduction of putative human pathogens and gut biomes by the wetlands.

Conclusions of the study were:

- wetlands performed very well in removing both the nutrients and heavy metals, the chemical quality of the water in the wetland was similar to river water
- good reduction of faecal coliforms (in March and July) and human pathogens after the wetland treatment
- wetlands can turn sewage and minewater microbiomes into a surface water microbiome

Additionally, there was good removal of phosphate in all sampling events.

David Werner

Benefits of Citizen Science:

- antidote to ‘fake news’ as co-creation of evidence can build trust
- teaches scientific methods
- creates freedom of information as the data is open access via the internet.

Ouseburn Citizen Science monitoring involved using simple test strips methods in Ouseburn. There is limited monitoring of the bacterial content of river water.

Some downsides to citizen science including the potential for replication, improper documentation and gaps in coverage. Newcastle University Urban Observatory has 7 water monitoring locations in the Ouseburn which provide continuous real time data, reliable parameters but are costly and there are some unreliable parameters. However, the data shows that water quality deteriorates during storm events for example on 8/8/21 there was a dramatic increase in faecal pollution way above bathing water quality. But a more concerning legacy of these storm events is the discharge of plastics into river than the microbial contamination.

There is a staggering amount of plastic waste in rivers. This is a great topic to engage with citizens, as it is easy to pinpoint where it comes from and identify some actions for prevention. A wide range of stakeholders would need to be involved to make improvements.

Opportunities to contribute to and learn from the Team SCP for example during events.

RW Has there been any research into how much carbon is locked up into reed beds? This would increase the drivers for this type of water treatment.

DW Not thought about carbon in reedbeds, likely to occur through accumulation of carbon in sediment like under peat.

LW Lamesley removal of iron and phosphates more on faecal coliforms and bacteria.

PS Many thanks to Aom and David for their presentation, did NW have any comments?

DW NW were pleased with the results, reedbeds work well at smaller sewage treatment works but difficult to scale-up to treat for example all sewage from Newcastle. Reedbeds have similar benefits to that of storm water ponds eg those at Newcastle Great Park,

PS Do the treatment works at Lamesley and the wider Team valley series of wetland typologies eg Lamesley Pastures, have a relative value of function to deliver water treatment? A comparison of the engineered reedbed /natural reedbed functionality to improve water quality.

ST There is a lot of variance in results especially for bacteria, is there any reason for this?

DW Every biological treatment has variance eg temperature, sunlight retention time, NU did not receive any information from NWG on this, although it was requested. The variance in flows entering the works would help with understanding this.

ST CS in Ouseburn connections NW was involved initially.

ACTION

ST to ask colleagues at EA about delivery of forthcoming changes in Environment Bill – real time water testing

3. **NW Water Environment Scheme – update for partners** Stephen Thompson NWG

The Water Environment Scheme is a commitment to deliver wider improvements, to accessible water environments for customers, which are above and beyond the water companies' regulatory commitments.

The three themes, which are linked to benefit indicators from the 25-year Environment plan, are:

- access
- wildlife and biodiversity
- water quality

This is a new bespoke approach and a water company first. Northumbrian Water is supporting delivery of projects for 21/22 and all years up to 2025. Funding available is £175,000 each year, across the North East and Essex and Suffolk, and the target is 58 km of improvements PA. The level of funding granted for a project depends on km of accessible water environment. As a rough guide £10k = 3 km

Accessible Water Environment (AWE) is calculated across all water habitats and access types, based on the following criteria:

- vicinity
- visibility
- sound
- touch and interactions

There is an internal and external steering group and no formal deadlines.

Other funding from Northumbrian Water is available from Branch Out schemes:

- core
- invasive species
- habitats

See NW webpages for scheme guidance and links **here**

Partners can engage via **email** or the **NWG Water Environment Improvements Mapping Portal**

For more information, contact Stephen Thompson NW Water Environment Coordinator: Stephen.Thompson2@nwl.co.uk

4. **Team Velley Flood Alleviation Scheme – Eslington Park Culvert, SuDs and NFM.** Amanda McKevitt EA

The team are currently working on detailed designs with ARUP for the Eslington and TVTE projects. Assessments have shown that the agreed level of protection is achievable through low level defences eg low kerbs and walls. UK land estates are about to speak to lease holders about these measures. The Kingsway culvert will not be deculverted but will be improved for fish passage.

There are several locations with potential for increasing water storage eg Watergate and Black burn and other upstream sites are being investigated. There are archaeological constraints which limit the potential for this at Lamesley Meadows.

NFM – modelling at Hedley Hall has shown that NFM here would not provide as much benefit as hoped but it is still under investigation

Shovel ready – Lady Park Burn work may be carried out in advance of completion of the Network Rail work at this site.

The Team have been discussing some possible surface water management 'quick-wins' with National Highways identified by Carl Hodgeson.

Discussions:

RW There might be potential funding for Hedley Hall NFM through links with Northumbria Water, information has been sent to ST.

ST Hedley hall aligns with initial mapping carried out for the Water Environment Improvements project.

LW/SG Groundwater investigations with Northumbria Water in similar locations as TV FAS

ACTION

SG to catch-up with AMcK

5. **A1 Widening and Beggars Woodland creation** Peter Shield GMBC and Becka Bessant (HE)

Peter Shield

A1 improvement works have started at Coal house and Birtley. As part of the requirement for offsite compensation woodland, DWT are planting new broadleaf trees at Beggers Wood. Last Friday DWT carried out a public consultation event regarding tree planting at Dunston Hill at Whickham Highway, this would be 26 ha of new woodland within the Team catchment managed and delivered by DWT.

Becca Bessant

The road improvement scheme Birtley to Coal House roundabout:

- Kingsway roundabout hydro-demolition May 2022
- Eighton Lodge hydro-demolition for carriageway widening
- Jctn 65 carriageway realignment and hardening

Ecologist Mark Wilson is checking vegetation clearance and the water discharge consent is with EA. Discharge will be treated before entering the River Team. Water Management plans set and reviewed.

SG Is it possible to share data from the groundwater monitoring boreholes?

BB Yes, RSK contractors are carrying out this monitoring, some are existing and some are new boreholes. Samples are being taken prior to and during the works. Surface water monitoring is also being carried out on the discharge and on surface water.

PS The Team SCP has previously seen all the landscape and ecological detailed design for Allerdene burn.

ACTION

BB to look into providing borehole and surface water monitoring data to the partnership

6. **AOB** ST EA

SG Struggling to get in touch with Janine Jonczyk from the Urban Observatory regarding rain gauges.

DW She will have moved onto other projects but will encourage her to get in touch with Sally

PS SCP needs to ensure organisations are not working in silos and taking advantage of opportunities for engaging with the public and making efforts to contact others. Could make better use of the partnership.

ST Data sharing on Teams group including WTT walkover info

Next meeting will be in April and will include a presentation on the Northumberland Groundwater project.

ACTION EAW to doodle poll potential dates in April